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ABSTRACT

In looking at whether clients will improve with counseling, counselors must first determine what kinds of outcomes are likely with certain clients. In order to make probabilistic statements about individual client outcomes, rather than about the more generalized outcome of counseling, a different approach is needed. Using data from counseling clients (N=1,811) who participated in a nationwide study of college and university counseling centers, an ordinal regression analysis was used to estimate the probabilities of four categories of client improvement using six independent variables. Four of these variables were found to be significant predictors of outcome in a previous study; two were included as a result of discussions about the previous study. Five of the variables were based on information that a counselor meeting a client for the first time would have available. The results show that previous experience as a client; readiness to change; level of symptomatic and interpersonal distress; pre-counseling clinical status; and the number of counseling sessions in which clients may be involved with are significantly related to probabilities of positive outcomes of treatment. Counselors can learn about what interventions work with different clients and will be better able to provide clients with information they need before they decide to enter counseling. (Contains 3 tables and 17 references.) (JDM)

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Running head: PREDICTING CATEGORICAL CLIENT IMPROVEMENT

Predicting Categories of Improvement Among Counseling Center Clients

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Paper presented at the annual meeting of the American Educational Research Association, April, 2001, Seattle, WA.

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Abstract

The fundamental question to which most clients want and deserve an answer is, "Am I going to get better (as a result of counseling)?" Although meta-analyses provide strong evidence supporting the efficacy of counseling in general, if one wants to make probabilistic statements about individual client outcomes—rather than about the more generalized outcome of counseling—a different approach is needed. Using clients' intake (pre-counseling) and post-counseling ratings of common problems derived from a multi-center database, an ordinal regression analysis was used to estimate the probabilities of four categories client improvement (or lack thereof) using six independent variables. Four of these variables were found to be significant predictors of outcome in a previous study; two were included as a result of discussions about the previous study. Five of the variables were based on information that a counselor meeting a client for the first time would (or could) reasonably have available. Our results show that previous experience as a client, readiness to change, level of symptomatic and interpersonal distress, pre-counseling clinical status, and the number of counseling sessions clients in which a client might be involved are significantly related to probabilities of outcome category membership.

Predicting Categories of Improvement Among Counseling Center Clients

Counseling clients can be viewed as consumers who have the need and a right to know the benefits they will receive from counseling. Although clients may frame the question in various ways, we believe that the fundamental question to which most clients want and deserve an answer is, "Am I going to get better (as a result of counseling)?" The answer to this question is a categorical one. For example, as a result of their counseling, clients may deteriorate and show a negative change, remain unchanged, show small to moderate positive change, or show large and "clinically significant" or clinically meaningful change. In order to be able to answer the question of whether the client is going to get better, counselors need their own answers to questions regarding "What kinds of outcomes are likely with what types of clients?" For both clients and counselors, the answers to these questions must be probabilistic in nature, communicating the likelihood of improvement or the likelihoods of various categories of improvement or types of outcome.

When considering counseling outcome, counselors are have been admonished to attend to characteristics of the client and the counselor, the type of counseling, and the nature of the outcome sought (e.g., Beutler & Clarkin, 1990; Kiesler, 1966; Paul, 1967). In this regard, counseling researchers have proceeded in their efforts by researching a few variables, some considered at only a few levels, and then analyzing the gathered data by postulating (at least implicitly) rudimentary models of the counseling effect.

A reasonable indicator of how a particular client will do in counseling could be based on the outcomes of similar clients. But if counseling outcome varies as a function of client characteristics,

then there must be sufficient outcome data on each type of client to make a reliable statement about client improvement.

One way to accomplish this is to aggregate the mean differences found across individual outcome studies and submit them to meta-analyses (e.g., see Smith, Glass & Miller, 1980). But while the effect size found in such meta-analyses usually provides strong justification that counseling is effective (which is important for the profession), the simple probabilistic statements deriving from the effect size provide a questionable basis for an individual client to decide whether or not to pursue counseling or for a counselor to assume that his or her work with a particular client will be effective.

In this regard, Hummel and Lichtenberg (1999) noted that although it is not the primary purpose of meta-analyses to make probabilistic statements regarding a client's likelihood of improvement as a result of counseling, doing so is not uncommon. Within reports on their studies, investigators frequently are found to present figures of overlapping normal distributions (one representing clients who received counseling and the other representing those in the control population). They then point out (by way of example) that a person at the mean of the treated population fell at the 75th percentile of the control group—deducing that the probability is 0.75 of an individual randomly drawn from the treated population being above the mean of the control population. (Note: Given the symmetry of the normal distribution, if the mean of those treated falls at the 75th percentile of the control population, then the mean of the control population must fall at the 25th percentile of the treated population. Therefore, 75% of those treated must fall above the mean of the control population.)

But it would be incorrect to assume that such a figure is synonymous with the probability that a <u>particular</u> client will show improvement, and in their paper, Hummel and Lichtenberg (1999) explored the limits of meta-analysis as a basis for this sort of justification of individual counseling

interventions. They concluded the while meta-analyses can (and usually do) provide strong justification for the profession, if one wants to make probabilistic statements about individual client outcomes—rather than about the more generalized outcome of counseling—one has to take a different approach.

In the discussion section of their paper, Hummel and Lichtenberg noted that in principle there is no reason why client outcome data could not be aggregated across collection sites (e.g., counseling centers), rather than across studies, in order to accumulate sufficient outcome data on each type of client in order to make reliable statements about client improvement. They commented that if sites/centers would standardize descriptions of counselors, treatments, clients (and client problems), and outcomes, they could cooperate in development and maintenance of a large database of client outcomes and use these data to provide clients and counselors with accurate probabilities for various outcomes.

Such a database exists, and at last year's annual meeting of the AERA, Lichtenberg and Hummel (2000) reported on an analysis of the outcomes of 1811 counseling clients seen at 38 different U.S. college and university counseling centers around the country. Client intake information (e.g., age, gender, ethnicity, readiness for counseling, symptom severity, history of previous counseling, current medication)—the limited sort of information that counselors might have on which to base an answer to a client's question regarding the likelihood of improvement—was used to predicted client outcome. The outcome variable in this study was a dichotomous variable (improved = a reduction in client symptoms; unimproved = lack of change or an increase in client symptoms).

The first analysis in that study was a preliminary logistic regression entering each of the available independent (intake) variables simultaneously as a block. This analysis (similar in intent to running an overall MANOVA) was run in order to demonstrate to us that our intake variable set

related significantly to the probabilities of outcome category membership. The second analysis was a stepwise logistic regression, using the same variable set—with each variable entering the final equation on the basis of its unique contribution to the estimation of the client outcome category membership probabilities.

The results of the analyses showed that previous experience as a client, readiness to change, and level of symptomatic and interpersonal distress were significant contribution to the estimation of the probabilities of outcome category membership. Specifically, clients who reported greater levels of distress and a greater readiness to change and who had not previously been in counseling were those most likely to improve in counseling (i.e., show an overall reduction in self-reported symptoms and distress).

In the discussion that followed the presentation of the Lichtenberg and Hummel paper, several issues were raised. Specifically, it was suggested that outcome findings could be enhanced by considering (a) additional categories of improvement, (b) whether or not the clients entered counseling at a "clinical level" of distress, (c) the reliability of client change, and (d) the length of counseling (number of sessions) received by the client.[1] In light of these issues, the purpose of this study was to reanalyze the counseling center data previously presented by Lichtenberg and Hummel with the goal of building upon and further clarifying and enhancing the prediction of clients' probabilities of various categories of counseling outcome.

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[1] Technically, the length of counseling is not information a counselor can know at the onset of counseling. Within the context of this study, the number of sessions completed by the client is a conditional variable—that is, the outcome prediction made for a particular client is based on the intake variables conditional on the client's completing some specified number of sessions.

Method

Participants

Participants in this study were the same 1811 counseling clients reported upon in the previous Lichtenberg and Hummel study. The participants were a sub-sample of 4679 clients participating in a nationwide study of college and university counseling centers conducted by the Research Consortium of Counseling and Psychological Services in Higher Education. The clients whose data were analyzed were those clients on whom complete data were available at intake on the independent variables used in this study and on whom outcome data and number of counseling sessions completed also were available.

Of our sample, one third were male. The majority (77%) of clients were Caucasian. The age of the clients varied from 16 to 60 (M = 23.01, SD = 5.4). Fifty percent (50%) of the clients previously had been in counseling, and 7% were currently on medication. Sixty-four percent (64%) of the clients had pre-counseling scores $\geq$ 63 on the OQ-45 total score, placing them in the "clinical" category at intake.

The counselors who saw the clients included practicum students, interns, and professional staff of the centers. The counselors (N=approx. 260) represented a variety of fields, although most were counseling psychologists. They represented diverse ethnic backgrounds, although most were Caucasian. The majority were female, although a significant minority of the counselors were male. Approximately half of the counselors were student trainees, the majority of whom were counseling center interns, although a significant minority were practicum students.

The data for this study were provided by the Research Consortium of Counseling and Psychological Services in Higher Education, which was established in 1990 to further research efforts on the practices of college and university counseling centers and the concerns of their clients. The

data analyzed were collected over the period of 1997 and 1998 and represent a subset of the data available from the consortium. Data routinely collected on the clients of the consortium member centers served as our data source.

Instruments

The instruments used in this study were the same ones reported in the Lichtenberg and Hummel (2000) study. They included the Outcome Questionnaire-45 (version 2) (OQ-45; Lambert, Hanse, Umpress, Lunnen, Okiishi, Burglingame, & Reisinger, 1999) and the Stages of Change Scale (SCS; McConnaughy, Prochaska & Velcier, 1983).

Outcome Questionnaire-45 (version 2) (OQ-45; Lambert, Hanse, Umpress, Lunnen, Okiishi, Burglingame, & Reisinger, 1999). Pre- and post-counseling data were derived from the Outcome Questionnaire-45. The OQ-45 is an instrument designed to measure client progress in therapy along three dimensions conceptualized by Lambert (1983) as important aspects of an client's life: (a) subjective discomfort (i.e., how a person feels inside), (b) interpersonal relationships (i.e., how a person gets along with significant others), and (c) social role performance (i.e., how they manage in important life tasks such as work and school).

The OQ-45 provides a total score and three individual domain scores. Each item on the questionnaire is scored on a five-point Likert scale (from 0-4), with some items reverse scored. The Symptom Distress (SD) score consists of 25 items and can vary from 0-100. The Interpersonal Relations (IR) score consists of 11 items and can vary from 0-44. The Social Role (SR) scale consists of 9 items and can vary from 0-36. Clinical cutoff scores have been established, with Total scores of 63 or greater, Symptom Distress scores of 36 or greater, Interpersonal Relation scores of 15 or greater, and Social Role scores of 12 or greater reflecting clinical levels of distress. Lambert and his colleagues have found no gender or racial differences on the OQ-45, suggesting that the OQ-45 does

not over- or underpathologize any particular gender or racial group. Test-retest reliabilities for the OQ-45 vary from a low of .78 for the Symptom Distress scale to .84 for the OQ-45 Total score (N=157; the retest time interval was not stated in the instrument's manual). Internal consistency coefficients (coefficient alpha) for the scales varied from .70 for the Social Role scale to .93 for the Total score (N=157). The concurrent validity of the OQ-45 has been estimated by correlating the scores of the instrument with the SCL-90-R (Derogatis, 1977). Notably, the OQ-45 Total score and the OQ-45 Symptom Distress score have been found to correlate highly with the General Severity Index (GSI) of the SCL-90-R (.78 and .82, respectively) for college counseling center clients. These results suggest considerable overlap between these indices of client symptomatic complaints.

Stages of Change Scale (SCS; McConnaughy, Prochaska & Velcier, 1983). The Stages of Change Scale (SCS) is designed to assess clients' readiness for change and their readiness to enter into and benefit from counseling. The scale assesses clients in terms of Prochaska's stages of change—stages at which clients might enter and begin counseling. Each stage is measured by eight Likert-type items. The first stage, Precontemplation, characterizes clients that are not choosing to change themselves. The second stage, Contemplation, characterizes clients who are aware of problems and may wonder whether counseling would be helpful to them. The third stage, Decision Making, characterizes clients who have defined their problems and made a commitment to change. The fourth stage, Action, characterizes clients who are actively working on their problem(s) or concern(s). A final stage, Maintenance, characterizes clients who are at the point of consolidating any changes they may have made in counseling. The authors report adequate reliability and validity evidenced over numerous studies. (Note: Although Prochaska's stages model includes five stages, the SCS data only included scale information for the Precontemplation, Contemplation, Action and Maintenance stages; absent is the Decision Making stage.)

Procedure

Participating clients completed the OQ-45 and SCS prior to their initial intake appointment with their individual counselor. Although the OQ-45 was readministered throughout the course of counseling, only the clients' initial OQ-45 and their final OQ-45, completed at termination, were used to assess counseling outcome.

Using their intake (pre-counseling) scores on the OQ-45, clients were designated as either "clinical" or "non-clinical" at the onset of their counseling. In accordance with the OQ-45 manual, clients with OQ-45 total scores $\geq$63 were designated as "clinical."

A client's outcome status, our dependent variable, was defined in terms of client change on the combined OQ-45 Total scale. Intake and post-counseling ratings on the OQ-45 were used to calculate a categorical index of improvement. The four ordered categories of client improvement (our dependent variable) were based on the OQ-45's "reliable change index" (RCI) (Jacobson, Follette, & Revenstorf, 1984) as reported in the instrument's manual (RCI =14). We used the RCI to construct an approximately 90% confidence interval on the true change score (observed change score $\pm$ 14). Our four categories of improvement were: (1) 80 through 14 = some degree of reliable negative change (i.e., the client became worse), (2) 13.99 through –13.99 = no reliable change (i.e., the change could not be reliably distinquished from measurement error), (3) -14 through -33.99 = small to moderate reliable positive change (i.e., the client became better); and (4) -34 through –98 = large positive reliable ["clinically significant"] change (i.e., the client was much better). [NOTE: (a) The break point of -34 for large positive reliable change was determined by adding -14 to -20, where 20 points represents a large effect size obtained by multiplying .80 times the standard deviation of the OQ-45 (SD = 25). Therefore, if a person scored -34, we could be about 90% confident that the person's true change score was greater than 20 points. "Clinical significance" in the sense used above is a

function of the reliability and the magnitude of the change—regardless of the initial status ("clinical" vs. "non-clinical") of the client. (b) A negative number indicates a decrease in client symptoms which is a positive change.]

Analysis

An ordinal logistic regression was used to estimate probabilities of improvement category membership as a function of the same four variables found to be significant predictors in the previous study's model (a client's intake scores on the OQ-45 social and interpersonal functioning scales and on the Contemplation subscale of the SCS and their history of previous counseling), together with the addition of length of counseling (number of sessions) completed by the client, and the client's clinical status at intake (clinical/nonclinical).

By (a) using a system of four outcome categories based on confidence intervals on the clients' true change scores—a system that included a category of "clinically significant change" (effect size $\geq$ .80), and by including as predictors (b) the pre-counseling clinical status of the clients and (c) their length of counseling, our analysis addressed each of the specific concerns raised regarding the previous analysis of counseling outcomes.

Results

Table 1 summarizes the means and standard deviations for the six independent variables used in the analysis.

Insert Table 1 about here

Using the four categories defined above as the dependent measure and the four independent variables from the previous year's study, an ordinal logistic regression was run. The prediction was

highly significant, $\chi^2(4) = 365.46$, p too small to evaluate, and each of the individual predictors made a significant contribution. Adding the variable of the number of counseling sessions to the equation significantly improved the prediction, $\chi^2(1) = 11.27$, $p = .001$. When the client's pre-counseling clinical status was added next, it also made a significant contribution, $\chi^2(1) = 4.20$, $p = .041$. The overall model based on our six independent variables yielded a chi-square of $\chi^2(6) = 380.918$, p to small to evaluate. Table 2 summarizes the regression weights (coefficients) assigned to each variable in the prediction equation. Table 3 presents the frequency and proportion of clients in our sample that were categorized in each of the four outcome categories, as well as the proportion of clients estimated by our model to be in each of those categories.

Insert Tables 2 and 3 about here

Examples of outcome predictions derived from the ordinal logistic regression model are presented in the following series of figures—each depicting the probabilities of the various categories of counseling outcome as a function of different client values on the predictor variables. Figure 1 displays the outcome category estimations for a client who would be classified as "clinical" (OQ-45 Total ≥ 63) at the onset of counseling, who had not previously been seen for counseling, and whose scores on the four continuous variables (symptom distress, interpersonal relations, contemplation about change in counseling, number of sessions) approximated the mean (or "typical client") score for clients in our sample. Under such conditions, the client would have an approximately 46% probability of showing some reliable improvement: 31% (reliably better) + 14% (reliably much better) and a 10% probability of showing reliable deterioration.

Insert Figure 1 about here

In Figure 2 we model a client has not previously been seen for counseling and whose symptom distress, interpersonal relations, and contemplation scales and number of counseling sessions completed are 1.5 standard deviations above the mean for our sample. Even without considering the OQ-45 Social Roles scale (which does not enter our model), the client's combined means on the symptom distress and interpersonal relations scales designate the client "clinical" at intake. Such a case might exemplify an individual new to counseling, who is experiencing extreme (i.e., clinical levels of) symptomatic and interpersonal distress, is well aware of his problem and wondering whether counseling might be helpful, and who committed (i.e., completed) 4 sessions of counseling. For such a client, the model would estimate an 80% likelihood of reliable improvement: 35% (reliably better) + 45% (reliably much better) and only a 1% probability of showing reliable deterioration.

Insert Figure 2 about here

In Figure 3 we model a client a client who previously has been seen for counseling, and whose scores on symptom distress, interpersonal relations, contemplation and number of sessions variables are set at 1.5 standard deviations below the mean of our sample. Such a case might exemplify a client previously for counseling who is experiencing relatively little symptomatic and interpersonal distress, is not really thinking about counseling, and who in fact is seen only for the intake session.

For such a client, the model would estimate only an 8% likelihood of reliable improvement and a 35% probability of deterioration.

Insert Figure 3 about here

The three figures depict the ordinal logistic regression model as implemented within an EXCEL spreadsheet. By selecting or entering different individual client values for each of the independent variables, one can model the effect of these different configurations of values on the estimated the probabilities of each type of client outcome.

Discussion

The results of our analysis show that previous experience as a client, readiness to change, level of symptomatic and interpersonal distress, pre-counseling clinical status, and the number of sessions to which clients commit themselves are significant estimators of the probability of outcome category membership. More specifically, the probability of clients' membership in each of four counseling outcome categories (reliable negative change/client became worse, no statistically reliable change, small to moderate reliable positive change; and large, reliable positive ["clinically significant"] change) could be reliably estimated based on their standing on several routinely collected intake variables, and conditional on the client completing a certain specified the number of counseling sessions.

The result of our previous study (Lichtenberg & Hummel, 2000) suggest that clients who report greater levels of social and symptomatic distress and a greater readiness to change and who have not previously been in counseling are those most likely to improve in counseling (i.e., show a

greater overall reduction in self-reported symptoms and distress). Our current analysis shows that the predictive power of these intake variables can be enhanced by adding to them a client's pre-counseling clinical status on the OQ-45 ("clinical" vs. "non-clinical") and the number of sessions the client may complete.

These results build upon as well as clarify and enhance the estimates of clients' probabilities of various categories of counseling outcome over those presented previously by Lichtenberg and Hummel (2000). Beyond merely estimating the probability of whether or not an individual client is likely to improve as a result of counseling (i.e., a simple reduction in client-reported symptoms), this reanalysis allows for the estimation of the likelihood of client deterioration, non-improvement, small to moderate improvement, and large, "clinically significant" improvement. And the explanatory power of the ordinal logistic regression equation was found to be enhanced by considering a client's pre-counseling level of symptomology ("clinical" vs. "non-clinical") and the amount of counseling (number of sessions) that a client might complete.

As data are collected within and across counseling settings, providers of counseling services will learn more about what interventions work for what kinds of clients under naturalistic counseling conditions and will be better able to provide client consumers with the information they need before deciding whether or not to enter into counseling—information that we believe needs to include a response to the question, "Am I going to get better?" A response to this question necessarily must be probabilistic. Counseling centers, like other behavioral healthcare settings, need to be able to meet the primary goals of health care, namely, to help the client when possible and to do no harm (Lyons, Howard, O'Mahoney & Lish, 1997; Ogles, Lambert & Masters, 1996; Sederer, Dickey & Hermann, 1996). Meeting these goals requires being able to establish and communicate realistic probabilities

for various counseling outcomes for the individual clients that are seen by their counseling staff so that these clients can make informed decisions about entering into counseling.

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Table 1

Means and Standard Deviations for the Six Independent Variables (n=1811)

Variable	M	SD
Previous Counseling (yes/no)	.50	.50
OQ-45 Symptom Distress	41.50	16.48
OQ-45 Interpersonal Relations	16.34	6.94
SCS Contemplation	34.45	3.76
# Sessions	4.05	3.83
OQ-45 $\geq$ 63 ("clinical" vs. "non-clinical")	.64	.48

Note: The mean for Previous Counseling is the proportion of clients responding "yes" to the item. The mean for OQ-45 $\geq$ 63 is the proportion of clients classified as "clinical" on the basis of their OQ-45 Total Score at intake.

Table 2

Logistic Regression Table

Predictor	Coefficient	St. Dev.	Z	p
Constant (1)	1.6193	.4291	3.7700	.0000
Constant (2)	4.6095	.4414	10.4400	.0000
Constant (3)	6.2201	.4516	13.7700	.0000
Previous Counseling	.0305	.0905	3.3700	.0010
Symptom Distress	-.0375	.0045	-8.3600	.0000
Interpersonal Relations	-.0216	.0082	-2.6400	.0080
Contemplation	-.0600	.0124	-4.8400	.0000
# Sessions	-.0407	.0117	-3.4700	.0010
OQ-45 $\geq$ 63	-.3189	.1550	-2.0600	.0400

Table 3

Proportions of Clients in Each of the Outcome Categories

Outcome Category	Empirical n in Each Outcome Category	Empirical Proportions	Estimated Proportions Based on the Prediction Equation[1]
Worse	176	.097	.071
Can't Tell	898	.496	.532
Reliably Better	474	.262	.281
Reliably Much Better	263	.145	.116

[1] Estimated roportions based on the prediction equation were derived by using the mean value for each of the predictor/independent variables in the prediction equation.

Figure 1

Prev. Counseling
No

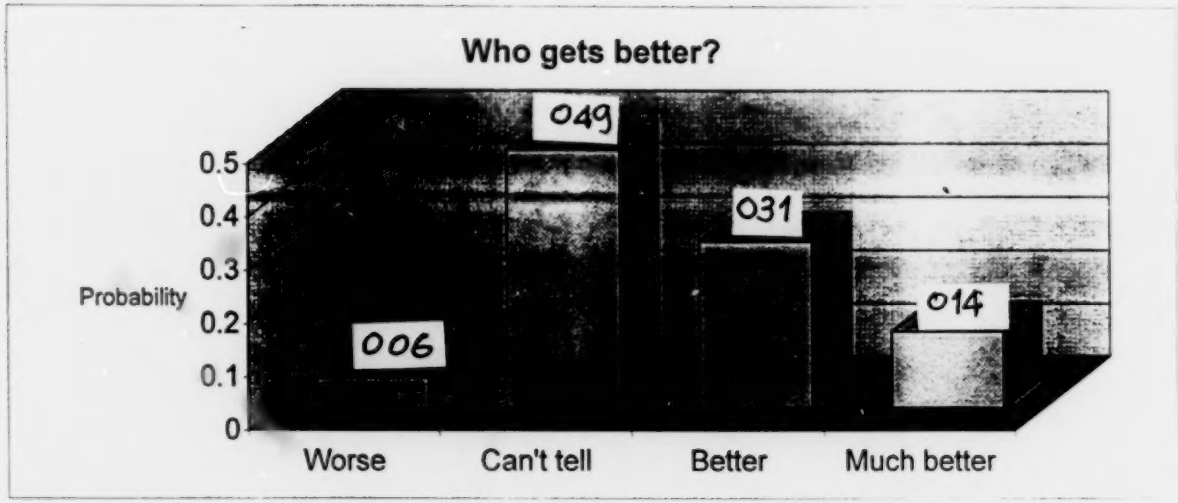
Symptom Distress
42

Interpersonal Relations
16

Contemplation
34

Clinical
Yes

Sessions
4



Probabilities	0.056	0.486	0.314	0.145

Better + Much better = 0.458

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Figure 2

Prev. Counseling: No

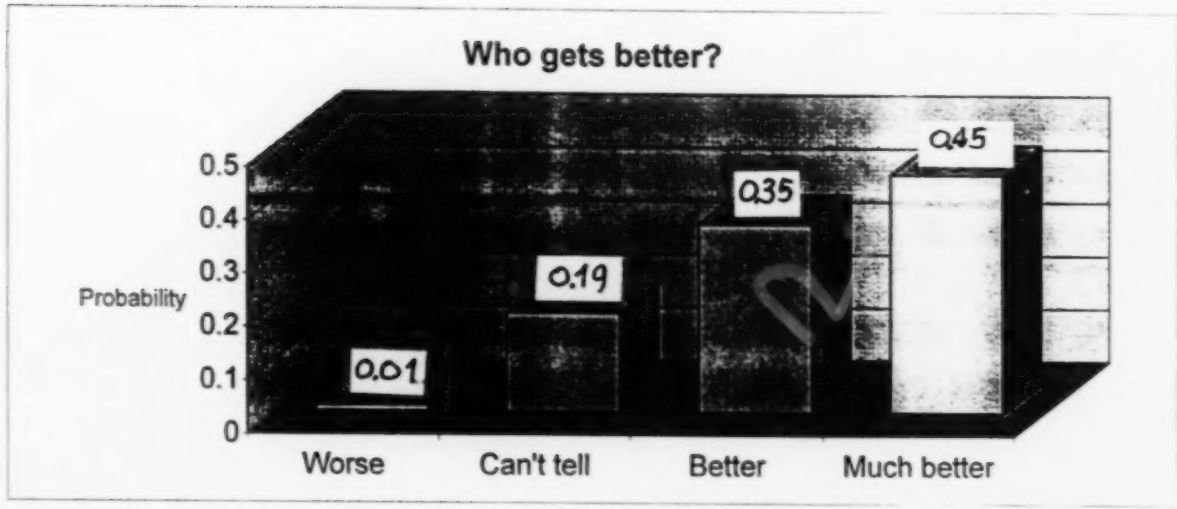
Symptom Distress: 62

Interpersonal Relations: 26

Contemplation: 40

Clinical: Yes

Sessions: 10



Probabilities	0.012	0.185	0.354	0.448

Better + Much better = 0.803

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Figure 3

Prev. Counseling
Yes

Symptom Distress
18

Interpersonal Relations
6

Contemplation
28

Clinical
No

Sessions
1

Probabilities	0.354	0.562	0.066	0.018

Better + Much better = 0.084

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